

## PATENT SPECIFICATION

1,080,046



Date of Application and filing Complete  
Specification: August 5, 1965.

1,080,046

No. 33628/65

Application made in Germany (No. F43670Vita/8h) on  
August 5, 1964.

Complete Specification Published: August 23, 1967.

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Index at Acceptance:—B2 E (1C, 1D, 1H); B5 N (17X, 17Y, 22X, 31X, 35X, 35Y, 55X, 57X, 60Y, 69X, 71X, 171, 191, 221, 238, 241, 250, 252X, 252Y, 253X, 254X, 254Y, 255X, 255Y, 298X, 322Y, 344, 345, 348, 349, 353, 512, 541, 543, 545, 546, 548, 560, 570, 598, 624, 631, 682, 690, 706, 707, 708, 713, 754, 755, 766, 768, 769, 781, 787, 788, 789, 790).

Int. Cl.:—B 32 b 5/20.

## COMPLETE SPECIFICATION

## NO DRAWINGS

## Composite Material

WE. SCHUSTERINSEL OPLADEN TEXTIL-  
VEREDLUNGS G.M.B.H., of Opladen, Ger-  
many, a body corporate organised under the  
Laws of Germany, do hereby declare the  
5 invention, for which we pray that a patent  
may be granted to us, and the method by  
which it is to be performed, to be particu-  
larly described in and by the following  
statement:—

10 This invention relates to a composite  
material which is especially useful as a  
textile floor covering or for other purposes.

According to the present invention there  
is provided a composite material, com-  
15 prising a top textile layer of knitted fabric  
and a bottom plastics layer of plasticised  
polyvinyl chloride which has been foamed  
and which contains a powdered elastomer.

The present material can provide a textile  
20 floor covering which is cheap and combines  
the desirable surface structure and strength  
of the knitted fabric with the advantages of  
a thermoplastic floor covering. The func-  
tion of the knitted fabric as top layer is  
25 to give the floor covering a textile velvety  
appearance. Preferably, the knitted fabric is  
formed from synthetic fibres, made, for ex-  
ample of polyamides, polyesters or poly-  
acrylonitrile. However, the knitted fabric  
30 can be made of natural textile fibres, such  
as wool. The knitted fabric is a warp knit  
or raschel fabric which is either veloured or  
teased, or teased and cut.

The object of the plastics coating is to  
35 give the covering a soft carpet-like feel  
when walked on. To this end, the plastics  
layer must be bulky and resilient. This  
property is produced by two means which  
are used in combination. The first means  
40 is provided by working a very finely-divided  
elastomer, preferably rubber powder, in a

proportion of from 20 to 50% by weight  
on the basis of the thermoplastics, into the  
plastics layer which is of plasticised poly-  
vinyl chloride. The other means is the use  
45 of a foaming agent, such as azodicarbon-  
amide, to foam the plasticised polyvinyl  
chloride. Very good results are obtained  
when the plasticised polyvinyl chloride is  
foamed and contains a powdered elastomer  
50 in the proportions specified. The plastics  
coating can also contain mineral fillers and  
colouring agents and stabilizers.

For improving adhesion between the  
plastics layer and the knitted fabric, an  
55 intermediate layer of polyvinyl chloride  
containing an adhesion-promoter e.g., an  
isocyanate-modified polyester, may be used,  
if desired.

In order to enable the floor covering to  
60 be laid using the known aqueous plastics  
dispersion adhesives, the underside can be  
lined with a woven fabric e.g. of jute. To  
facilitate laying, the side to be laid in  
contact with the floor can be provided  
65 with an adhesive layer protected by a pull-  
off foil e.g. silicone-treated paper, which is  
pulled off shortly before laying.

The present composite material can be  
shaped e.g. by vacuum deep drawing, just  
70 like thermoplastic slabs and so on, and can  
therefore be adapted to complicated floor  
shapes such as are found, for instance, in  
private motor vehicles.

The invention will now be illustrated by  
75 the following Examples.

## Example 1.

A coloured warp knit fabric consisting  
of polycaprolactam yarns was teased on a  
teasing machine and then cut. After carding,  
80 the underside of the knitted fabric thus pre-  
pared was coated with an intermediate layer

[Price 4s. 6d.]

of the following composition:

- 100 g. of polyvinyl chloride
- 60 g. of dioctylphthalate
- 20 g. of chalk
- 5 10 g. of soot
- 13 g. of a polyester formed from adipic acid, hexanediol and trimethylol propane, as adhesion promoter
- 11.4 g. of a 75% solution of an isocyanate resin prepared from trimethylol propane and toluenediisocyanate.

The coated fabric was then heated to about 120°C. to gel the polyvinyl chloride.

- 15 The applied material comprised 80 g./m.<sup>2</sup> of dry substance. The function of this layer was to ensure that the next coat adhered to the knitted fabric satisfactorily.

A paste having the following composition was then applied in a quantity of 600 g./m.<sup>2</sup> to this intermediate layer:

- 100 g. of polyvinylchloride
- 75 g. of dioctylphthalate
- 30 g. of powdered rubber
- 25 2 g. of azodicarbonamide.
- 6 g. of lead phthalate

The coating on the fabric was then foamed and gelled at 185°C. for about 1 minute.

*Example 2.*

- 30 A knitted fabric of polyamide yarn was prepared and provided with an intermediate layer as described in Example 1 whereafter a plastics bottom layer having the following composition was applied in a quantity of 600 g./m.<sup>2</sup>:

- 100 g. of polyvinyl chloride
- 30 g. of powdered rubber
- 60 g. of dioctylphthalate
- 25 g. of benzyl-butyl phthalate
- 40 2 g. of azodicarbonamide
- 6 g. of lead phthalate

The plastics layer was foamed by heating it for a few minutes at 190°C. and simultaneously gelled. A teased cut knitted fabric having an elastically foamed plastics bottom layer about 3 mm. thick was obtained.

*Example 3.*

- 50 A knitted fabric of polyamide yarn is prepared and provided with an intermediate layer as described in Example 1 whereafter a plastics bottom layer having the following composition was applied in a quantity of 1200 g./m.<sup>2</sup>:

- 55 100 g. of polyvinyl chloride
- 30 g. of powdered rubber
- 30 g. of benzyl-butyl phthalate
- 20 g. of dioctylphthalate
- 50 g. of polymer plasticiser (mixture of polypropylene adipate and phthalate)
- 60 2 g. of lead phthalate
- 4 g. of azodicarbonamide

The plastics layer was foamed and simultaneously gelled by being heated to 190°C. for a few minutes. A teased cut knitted

fabric having a resiliently foamed plastics bottom layer about 6 mm. thick was obtained.

WHAT WE CLAIM IS:—

1. A composite material, comprising a 70 top textile layer of knitted fabric and a bottom plastics layer of plasticised polyvinyl chloride which has been foamed and which contains a powdered elastomer.

2. A material as claimed in claim 1, 75 wherein the elastomer is rubber powder.

3. A material as claimed in claim 1 or 2, wherein the knitted fabric is made of synthetic fibres.

4. A material as claimed in claim 1 or 80 2, wherein the top textile layer is a teased knitted fabric.

5. A material as claimed in claim 4, wherein the top textile layer is a teased and cut knitted fabric.

6. A material as claimed in claim 5, 85 wherein the top textile layer is a veloured knitted fabric.

7. A material is claimed in any one of claims 1 to 6, wherein an intermediate layer 90 of polyvinylchloride containing an adhesion promoter is disposed between the top textile layer of knitted fabric and the bottom plastics layer.

8. A material as claimed in any one of 95 claims 1 to 7, wherein the material is lined on the underside with a woven fabric.

9. A material as claimed in claim 8, wherein the woven fabric is of jute.

10. A material as claimed in any one of 100 claims 1 to 7, wherein the plastics layer has an adhesive layer on the side to be laid in contact with a floor.

11. A composite material substantially 105 as hereinbefore described in any one of the foregoing Examples.

12. A process for manufacturing the composite material claimed in any one of 110 claims 1 to 11, wherein a polyvinyl chloride paste containing an adhesion-promoter is first applied to the underside of synthetic knitted fabric, and gelled by heat treatment, whereafter a polyvinyl chloride paste containing a foaming agent and a powdered elastomer is applied, foamed by heat treatment and gelled.

13. A process as claimed in claim 12, wherein the foamable polyvinyl chloride paste also contains a filler, a colouring agent and/or a stabiliser.

14. A process for preparing a composite 120 material substantially as hereinbefore described in any one of the foregoing Examples.

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